

APPENDICES

APPENDIX A - NATIONAL INSTRUMENTS GPIB-PC INSTALLATION NOTES

The following paragraphs are extracted from the National Instruments manual for the GPIB-PC board.

THE GPIB-PC SOFTWARE

Before you install your software, you might wish to review the files on your GPIB-PC distribution disk to gain an understanding of what they are.

The following files are the main files of the GPIB-PC software.

- Device Handler - GPIB.COM is loaded at system start-up by the DOS operating system. Handler is a term used by National Instruments to refer to a loadable device driver.
- Language Interface File - BIB.M provides an application program that is written in BASICA access to the GPIB-PC handler.
- Declaration File - DECL.BAS contains code to be placed at the beginning of the BASICA application program.

Additional Programs and Files

The following additional programs and files include installation, test, and example programs.

- Installation and Start-up - IBSTART.BAT is a multipurpose program that performs the software installation. It copies files, modifies CONFIG.SYS (the DOS system configuration file) using MKCFG.EXE, and tests the hardware using IBDIAG.EXE.
- Installation Tests - IBDIAG.EXE tests the hardware installation before the GPIB software is configured and installed. After the handler is installed, IBTEST.BAT confirms that both the software and hardware are installed and functioning properly. The test is executed in two parts using IBTSTA.EXE and IBTSTB.EXE.
- Software Configuration - IBCONF.EXE allows you to change the software parameters and other data used by the handler.
- Interactive Control - IBIC.EXE allows you to execute the

handler functions interactively from your keyboard. It helps you to learn the functions, to program your instrument or other GPIB device, and to develop your application program.

MORE ABOUT IBCONF

IBCONF is a screen-oriented, interactive program that comes on the distribution disk of your GPIB-PC package.

You use IBCONF to edit the description in the handler of characteristics of the devices and boards in the system. Running IBCONF to place this information directly in the handler eliminates having to restate it inside each application program.

IBCONF passes two groups of features to the handler. The first group consists of the characteristics of the instruments or devices attached to your GPIB-PC. The second group consists of the characteristics of each GPIB-PC installed in the computer.

Characteristics of the Instruments

- A symbolic name of each device on the GPIB (such as DEV5 or PS5010).
- The GPIB-PC access board for each device (e.g., GPIB0). The access board is discussed fully in "Device Map Concepts and Terms" in the National Instruments manual.
- The primary and, if used, the secondary address for each device.
- The time limit that is to be imposed when executing certain functions. This is to ensure that accessing a powered-off device does not hang up the GPIB indefinitely.
- How I/O transmissions to and from the device terminate. Some devices require or append an end-of-string character, such as the ASCII line feed character, to data strings. Others use the GPIB END message, which is sent or received via the EOI signal line. Still others use both. Some terminate messages only when a predetermined number of bytes are send or received.

Characteristics of each GPIB-PC

- Its symbolic name (such as GPIB0 and GPIB1).
- Its computer I/O or port address.
- Whether it is the System Controller of the devices on its bus.

- The time limit to be imposed when executing certain functions.
- How I/O transmissions to and from the board terminate when executing board calls, i.e., by end-of-string character, END message, and/or byte count.
- What interrupt level the board uses.
- What DMA channel, if any, the board uses.
- Whether it uses high speed or normal timing when transmitting data to a device. With normal timing there is a delay of at least two microseconds after the data is placed on the GPIB before the Data Valid (DAV) line is asserted. With high speed timing, this delay is decreased to about 500 nanoseconds.

DEFAULT CONFIGURATIONS

Just as the hardware has factory default settings for switches and jumpers, the software also has factory default configurations. For example, the default device names of the 16 GPIB devices are DEV1 through DEV16, but you might wish to assign more descriptive names to each device, such as METER for a digital multimeter.

You can also use IBCONF simply to look at the current default settings in the handler file.

If you do not make changes using IBCONF, default characteristics of the software remain in effect.

Primary Default Characteristics

The following are the primary default characteristics of the handler.

- There are 16 active devices with symbolic names DEV1 through DEV16.
- GPIB addresses of these devices are the same as the device number; for example, DEV1 is at address 1.
- The 16 devices are assigned to GPIB0 as their access board. GPIB0 is the symbolic name of the first GPIB-PC board in your system. If you have an additional GPIB-PC in your system, its symbolic name is GPIB1.
- Each GPIB-PC is System Controller of its independent bus and has a GPIB address of 0.
- The END message is sent with the last byte of each data

message to a device. Each data message that is read from a device is automatically terminated when END is received. No end-of-string character is recognized.

- The time limit on I/O and wait function calls is approximately 10 seconds.
- GPIBO is a Model GPIB-PC2A, is at base I/O address hex 02E1, and uses DMA Channel 1 and TLC Interrupt Line 7.
- You must run IBCONF if you are not using a GPIB-PC2A or if you have changed the hardware switches/jumpers on any GPIB-PC from the factory settings. Otherwise, it is unnecessary to run IBCONF. Consult the appropriate supplement to Section Two of the user manuals to find the factory settings of your GPIB-PC model.

RUNNING IBCONF

When you ran IBSTART, a copy of IBCONF.EXE was placed on your boot drive.

To run IBCONF, go to the boot drive and enter:

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ibconf
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IBCONF scans the handler file, GPIB.COM, and reads its data structures into memory. The program then displays the Device Map for board GPIBO.

Modify only the copy of GPIB.COM created by IBSTART in your boot directory by always running IBCONF from your boot directory. Never modify the master copy on the distribution disk. This would happen if you ran IBCONF from the distribution disk and if the distribution disk were not write-protected.